TIDLAND WINDING SOLUTIONS

MAXCESS®

TIDLAND

Tidland G890
External Element Shaft
Operation and Maintenance

EN

3" Shaft Diameter

MI 746511 1 F

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About these operating instructions

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Periodically there will be updates to this manual. The latest version is available at *www.maxcessintl.com* or by calling your regional office listed on the back page of this publication.

These instructions are designed to help put the external element winding shafts into service and provide important notes for the proper use of the shaft. These instructions are valid for following shaft series:
Series G890 and G890C
These instructions are important for the machine manufacturer, end user, machine operator and maintenance personnel. Read and understand these instructions before installing and operating the shaft.

The instructions must be read and used by all persons who have the responsibility of installing and maintaining these shafts. These instructions must be retained and incorporated in the technical documentation for the machine or partly completed machinery into which the shaft is installed.

These are the original instructions, written in English.

Theory of operation

The Tidland G890 air shaft is a medium to wide web width core shaft, made of aluminum or steel, with external expanding elements. External bladders activate the expanding elements (rubber or aluminum strips) to grip the core. The bladders are ultrasonically sealed and secured with screw clamps. Air is delivered to the shaft through a valve located in the end or on the side of the shaft body, or through a rotary union.

Model number key

Shaft series – shaft type – mounting style

Shaft series	G – Global
Shaft type	890 = External element shaft
Mounting type	None = drop-in C = cantilevered E = extruded body

Available models

G890
G890C
G890E

Safety Information

When using this Tidland product, always follow basic safety precautions to reduce the risk of personal injury. Your company's safety instructions and procedures should always be followed. When using this product with any other equipment or machinery, all safety requirements stipulated by that equipment or machinery manufacturer must be followed. Compliance with local, state, and federal safety requirements is your responsibility. No part of these or the following instructions should be construed as conflicting with or nullifying the instructions from other sources. Be familiar with the hazards and safety requirements in your work environment and always work safely.

Read and understand all instructions and shaft design application limits before operation.

- Never use this product for a purpose or in a machine that it was not specifically designed for. See Product Safety Data Sheet (PSDS).
- Do not exceed the operation loads for this shaft as noted on its PSDS, Product Safety Data Sheet.
- Follow all warnings and instructions marked on the product and on the PSDS.
- Do not use fingers or other objects to deflate the shaft; use only the Tidland deflation tool.
- Inspect the shaft for wear and/or other safety and functional deficiencies daily, before each use.
- Wear safety glasses or proper eye protection when inflating or deflating or otherwise operating the air system.
- Do not remove or otherwise alter any setscrews or fastening devices prior to using this product.
- Do not operate this product if any setscrews or fastening devices are missing.
- Do not lift shaft manually if it is beyond your capacity. Loads over 1/3 your body weight may be prohibitive. Consult your company safety policy.
- When lifting a shaft, use proper lifting techniques, keeping back straight and lifting with the legs.

(continued)

- Do not carry or lift this product over wet or slippery surfaces.
- Use appropriate mechanical lifting devices, such as a hoist or shaft puller, for heavier shafts.
- When performing maintenance or repair procedures, do not pressurize the shaft if journal setscrews are loose or missing.
- When performing maintenance procedures, do not pressurize the shaft if the journal is missing.
- All replacement parts used on this product should be made to original Tidland specifications.
- All maintenance and repair procedures performed on this product should be done to Tidland specifications by qualified personnel.

Basic safety information

To ensure safe and problem-free installation of the winding shaft, the shaft must be properly transported and stored, professionally installed and placed in operation. Proper operation and maintenance will ensure a long service life of the shaft. Only persons who are acquainted with the installation, commissioning, operation and maintenance of the system and who possess the necessary qualifications for their activities may work on the shaft

Proper use

- The Tidland G890 shaft is intended to be used on unwind or rewind machines.

Improper use

- Operation outside the technical specifications
- Any other use than the proper use shall be deemed inappropriate.

Basic safety information
(continued)

Installation and commissioning

WARNING – Danger of falling down or muscle or skeletal injury during installation
The larger design shafts are heavy. Appropriate equipment is to be used and the safety rules of the company must be observed.

Operation

WARNING – Danger of entanglement or pinching during operation
Keep hands and loose clothing away from rotating shaft.

Maintenance and repair

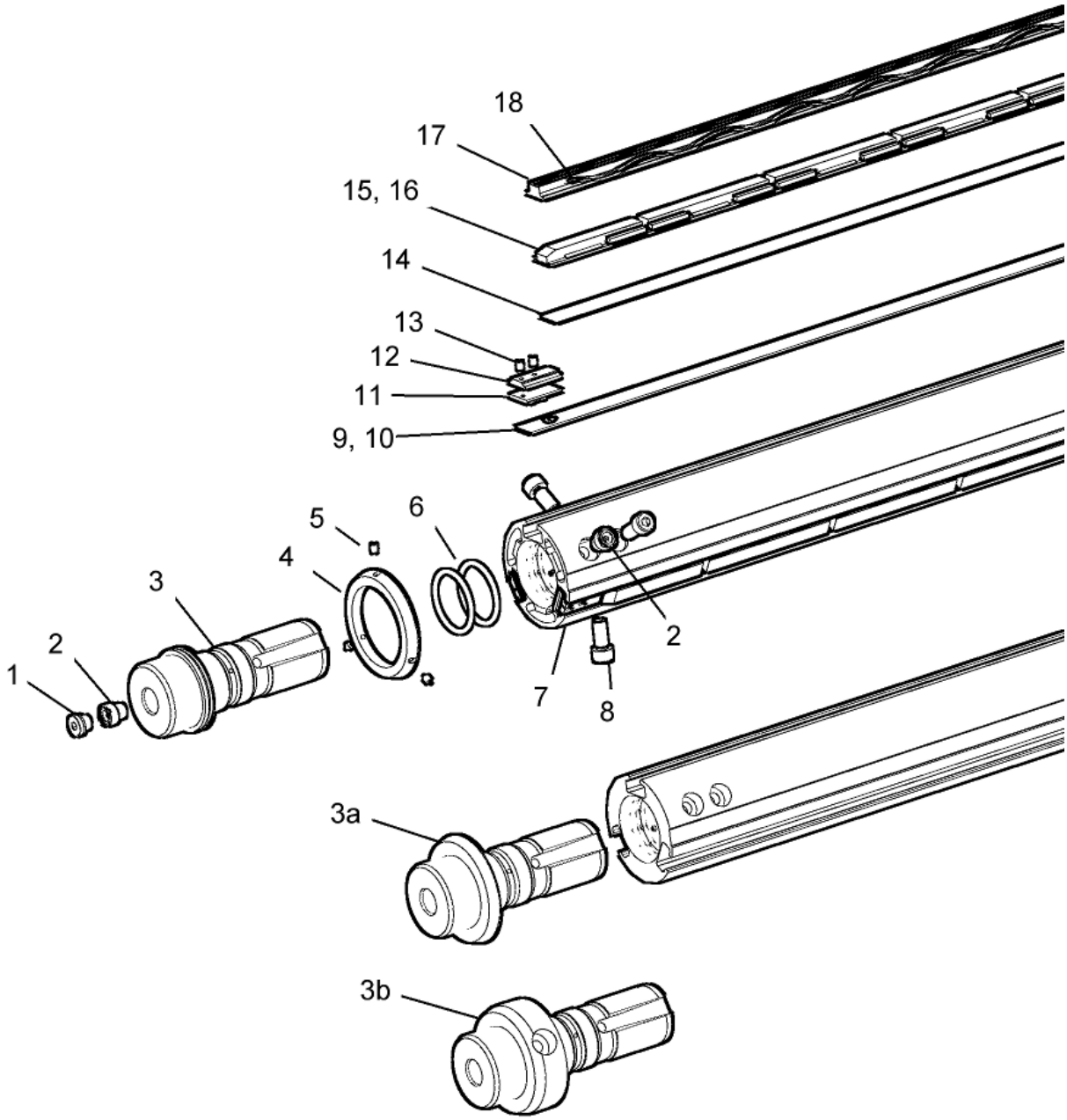
WARNING – Danger of entanglement or pinching
Maintenance and repair tasks on the shaft must be performed only when the machine has been stopped and has been secured from being turned on again.

WARNING – Danger of bodily injury or damage to hearing.
Do not inflate bladders without the leaves installed.

Decommissioning

The shaft must be disposed of in accordance with all the applicable national, state and local regulations.

Drop-in shafts



Typical both ends, except for valve.

Parts list

* Recommended spare parts a/r = as required

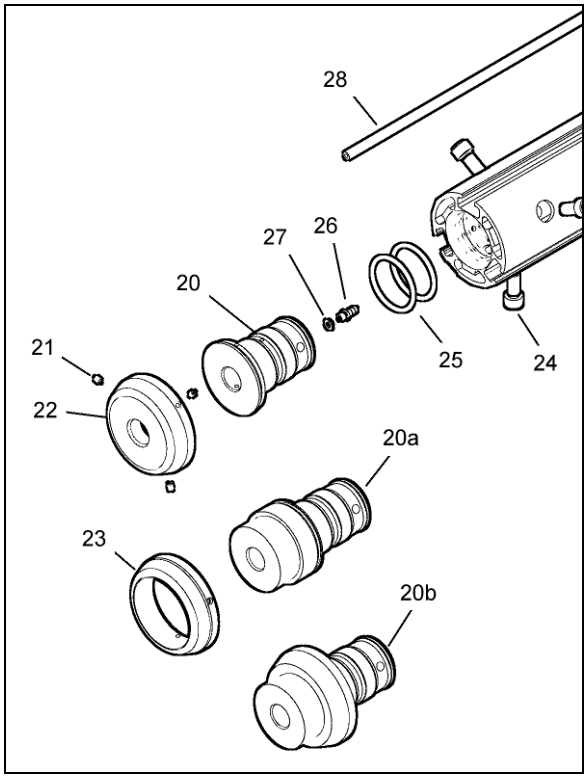
	Item	Description	Qty	Tidland Part No.	Europe Part No.
	1	End plug (for use with side valve location)	1	128045	M186986
**	2	Valve, G1/8 (located in end or side)	1	739343	M266978
	3	Journal	1	Custom	Custom
	3a	Journal with shoulder (items 4, 5 not used)	1	Custom	Custom
	3b	Journal with shoulder valve (items 4, 5 not used)	1	Custom	Custom
*	4	Body end cover	2	744219	M257917
	5	Set screw, M4 x 6 mm (3 per body end cover)	6	739345	M141619
	6	O-rings, Parker 2-129	4	520007	M192279
	7	Shaft body	1	Custom	Custom
	8	Soc hd cap scr, M8 x 20 mm zinc plate	6	739337	M127702
*	9	Bladder material	a/r	739338	M193425
*	10	Air fitting	a/r	739339	M250318
	11	End clamp, bottom	a/r	740602	M237218
	12	End clamp, top	a/r	740601	M237217
	13	Set screw, M4 x 6 mm (2 per clamp assembly)	a/r	130304	M141619
	14	Protection strip	a/r	739340	M245285
***	15	Rubber element, 10.3 mm high (in shafts after 05/2013)	a/r	759684	n/a
*	16	Poron spring	a/r	740605	M272799
	17	Aluminum strip (option)	a/r	740599	M112710
	18	Wave spring (2 per aluminum strip)	a/r	740600	M246628
		Optional			
		Calibration tape	1	Custom	Custom

** Valve gasket is available separately (Tidland 745181) (Europe M284758)

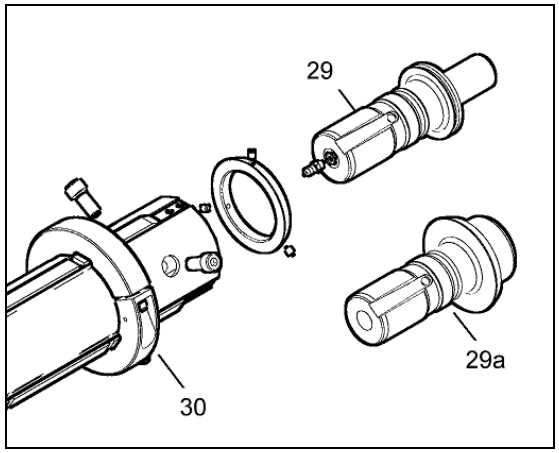
*** Shafts stamped Fife-Tidland GmbH use element 8.7 mm high (Tidland 739341) (Europe M326848)

Cantilevered shafts

Free end



Fixed end



Note:
Expansion element components are common to both shafts. See pages 3-1 and 3-2 for part numbers.

	Item	Description	Qty	Tidland Part No.	Europe Part No.
	20	Air plug, free end (use with items 21, 22)	1	744481	M367153
	20a	Journal with collar (use with items 21, 23)	1	Custom	Custom
	20b	Journal with shoulder	1	Custom	Custom
	21	Set screw, M4 x 6 mm	6	739345	M141619
	22	Nose cone (use with items 20a, 21)	1	744480	M265884
	23	Nose cone, simple (use with items 20a, 21)	1	744874	M263932
	24	Soc hd cap scr, M8 x 20 mm zinc plate	6	739337	M127702
	25	O-rings, Parker 2-129	2	520007	M192279
	26	Hose barb fitting	2	745111	M229812
	27	Gasket	2	133720	M188639
	28	Air hose (required for rotary union valve)	a/r	128898	M187226
*	29	Journal (machine end)	1	Custom	Custom
	29a	Journal with shoulder (machine end)	1	Custom	Custom
	30	Core stop (optional)			
		For 3 elements	1	747295	M269348
		For 4 elements	1	747297	M369650

* Shafts built in April/May 2012 use an adapter with gasket in this journal.

Installing the shaft

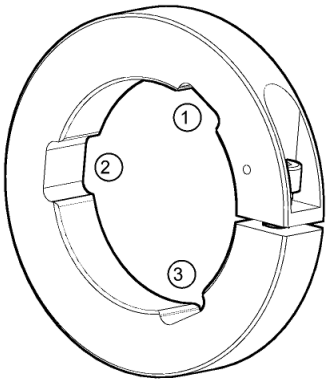
WARNING – Danger of falling down or muscle or skeletal injury during installation
The longer shafts are heavy. Appropriate equipment is to be used and the safety rules of the company must be observed.

General

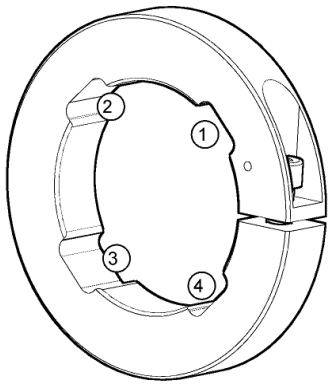
1. Install shaft as required for your machine application.
2. Adjust core stop, if installed.
3. Slide the core onto the shaft.

Installing a core stop

1. Loosen the M8 bolt in the core stop.
2. Move the core stop to the desired position on the shaft body and tighten the bolt to 20 Nm [177 in·lbs].



For 3 elements



For 4 elements

Operation

Air pressure

Use only clean, dry, non-lubricated air.

Shaft operation requires 5.5-8.3 bar [80-120 psi].

Connect air hose to the air supply. When inflating shafts not equipped with a rotary union, Tidland recommends the use of a Tidland Inflation Tool. See page 5-1.

Preparing the shaft for operation

Do not rotate shaft without a core installed on expansion elements.

1. Position the shaft in the core.
2. Ensure that all expansion elements are covered by cores or rolls.

Inflating the shaft

Use the Tidland Inflation Tool to inflate the shaft. Hold the nozzle in place until the line pressure air gauge indicates 5.5-8.3 bar [80-120 psi].

Deflating the shaft

Use an appropriate tool to release air from the shaft.
Do not use your finger to deflate the shaft.

The Tidland Air Release Tool is available on request.
See page 5-1 for part number.

Recommended tools and supplies

Hex drive wrenches: 2 and 6 mm
Tidland inflation tools (contact Maxcess for options)
Tidland air release tool (Part No. 111630)
Tidland valve removal tool:

North America	745083 (wrench)
	749067 (tool bit only)*
Europe	M296213 (wrench)
	M373530 (tool bit only)*

Dow Corning Molykote® 55 o-ring grease
Loctite® 222 (or equivalent)
Loctite® 243 (or equivalent)
Loctite® 545 (or equivalent)
Hole punch guide (Tidland Part No. 760792)
Hole punch tool (Tidland Part No. 760668)

* This part is a tool bit for use with a torque wrench.

Using Loctite or equivalent thread locker

Always use a thread locker on component threads during reassembly.

Component	Threadlocker/sealant
Element end clamp fasteners Air fitting barb	Loctite® 222
Journal or end cap fasteners	Loctite® 243
Valves	Loctite® 545

Maintenance schedule

Daily
Keep shaft clean and dry.
Remove dust and debris buildup with compressed air.

Periodically
Inspect journals for wear.
Check for worn or damaged expansion elements.

Removing a journal

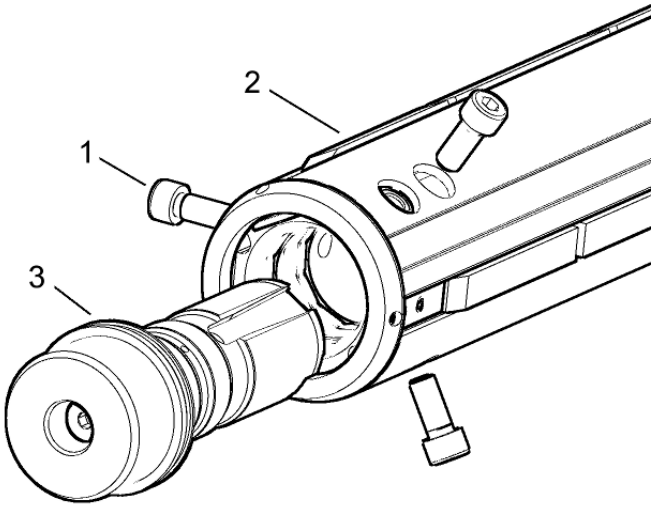
Drop-in shaft

Deflate shaft and remove core/roll.

Secure the shaft in a round clamping fixture before removing the journal.

1. Remove the M8 socket head cap screws.
2. Use impact puller to remove the journal.
3. Note the o-rings in the shaft body. Inspect them for wear or damage and replace if necessary. Lubricate with o-ring grease.

1	M8 Soc hd cap screw
2	Shaft body
3	Journal



Shaft shown with three expanding elements.

Reinstalling expansion elements; page 5-8

Reinstalling journals; page 5-4

Removing a journal

Cantilevered shaft

Deflate shaft and remove core/roll.

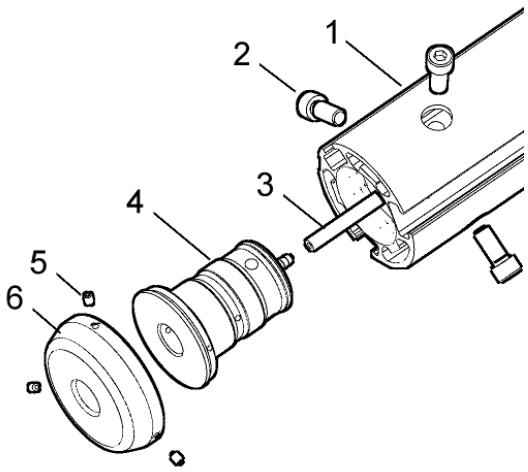
Machine end

1. Remove shaft from machine.
2. Follow the instructions on page 5-2 for removing journal from a drop-in shaft.
   Note: There are no o-rings in the machine end.

Operator end

1. Remove the M4 set screws from the end cover.
2. Carefully pull the journal feature from the shaft and detach the air hose.
3. Note the two o-rings inside the shaft body. Inspect them for wear or damage and replace if necessary. Lubricate with o-ring grease.

1	Shaft body
2	M4 Soc hd cap screw
3	Air hose
4	Air plug (or journal)
5	Set screw
6	End cover



Reinstalling expansion elements; page 5-8

Reinstalling journals; page 5-4

Replacing the air hose; page 5-11

Reinstalling a journal

Drop-in shafts

Drop-in shaft journals require a press fit.

1. Apply o-ring grease to the fit area and press fit the journal into the shaft body.
2. Reinstall and torque the socket head cap screws to 20 Nm [177 in•lbs].

Cantilever shafts

The machine end journal requires a press fit. Note: There are no o-rings in the machine end of a cantilever shaft.
If using rotary union, you will need to reconnect the air hose to both journals during reassembly.

1. Apply o-ring grease to the fit area and press fit the journal into the shaft body.
2. Reinstall and torque the socket head cap screws to 20 Nm [177 in•lbs].

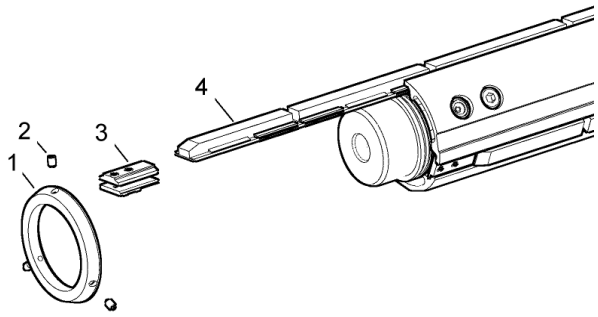
The operator end journal feature is designed with a slip fit. Lubricate o-rings with o-ring grease.

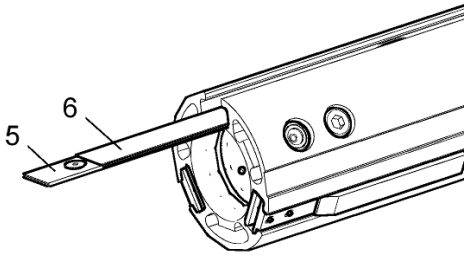
1. Insert the journal feature into the shaft body; reinstall and torque the socket head cap screws to 20 Nm [177 in•lbs].
2. Reinstall the end cover and torque the set screws to 1.5 Nm [13 in•lbs].

Air system

Replacing a bladder

1. Remove three M4 set screws from the end cover.
   If your shaft uses a journal with shoulder, you will need to remove the journal to access the expansion elements. See page 5-2.
2. Loosen — do not remove — the M4 set screws in both end clamps.
3. Remove clamps and expansion elements from shaft.





1	End cover
2	Set screw
3	End clamp assembly
4	Expansion element with wave springs
5	Sealed bladder assembly
6	Protection strip

External elements

Inspect elements for excessive wear or damage and replace as necessary. Call Maxcess Customer Service for replacement parts for your shaft. Please have your shaft serial number available.

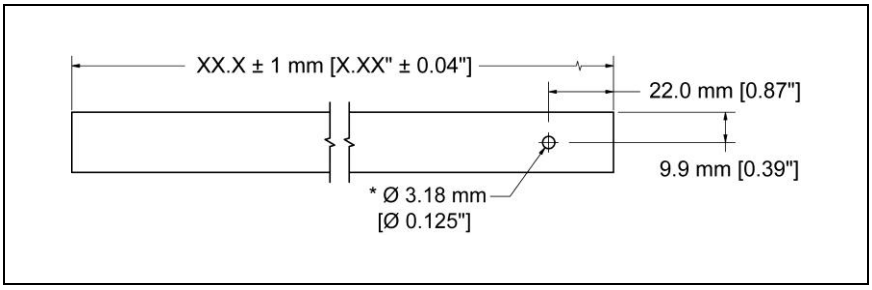
(continued)

Cutting the new bladder

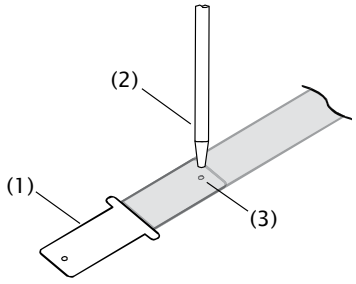
Using bulk bladder material

If you use bulk bladder material instead of a sealed bladder assembly, use the following formula to determine the correct replacement bladder length for your shaft.

bladder length = body length - 2 mm [.079"]



* Punch through one wall only



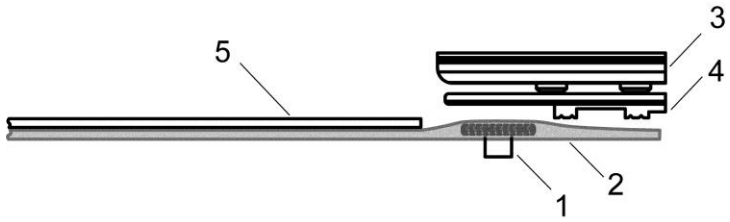
1	Hole locater guide
2	Tidland hole punch
3	Punch mark

See page 5-1 for part numbers.

(continued)

Installing the expansion elements

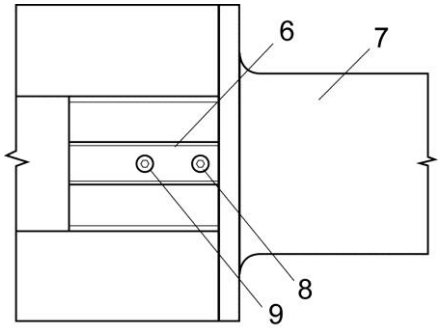
Do not use lubricants between the bladder and the protection strip. These components must be clean, dry and free of debris.



1	Air fitting
2	Bladder
3	Top clamp w/ set screws
4	Bottom clamp
5	Protection strip

Installing expansion elements

1. Install the expansions element in the slot. If using aluminum strips, see page 5-9 to install wave springs.

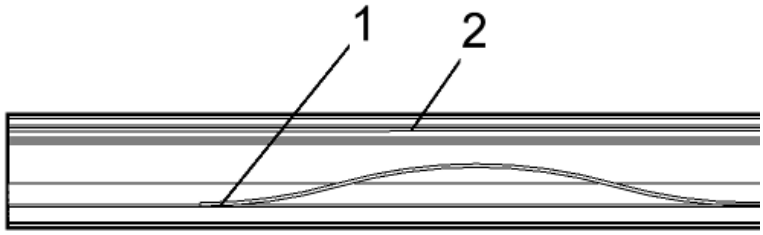


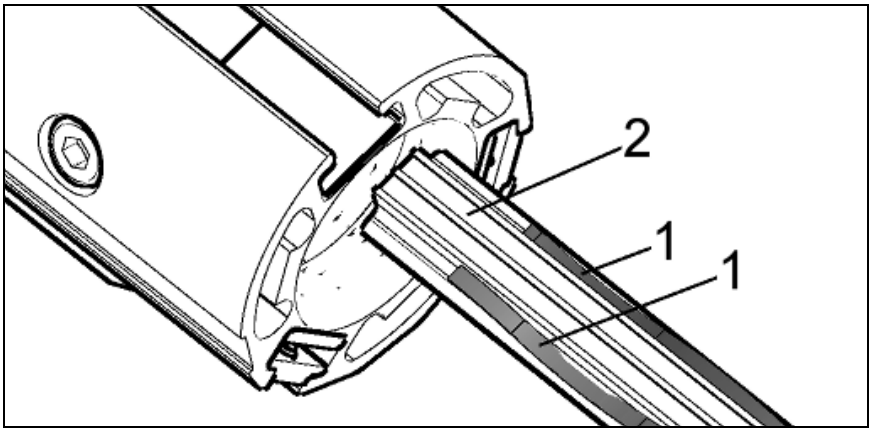
6	End clamp in slot
7	Journal (or nose cone)
8	Outboard set screw
9	Inboard set screw

2. Install the remaining end clamp assembly and torque the end clamp set screws in the following order:
    1) Outboard screw: 1 Nm [9 in·lbs]
    2) Inboard screw: 1.5 Nm [13 in·lbs]
    3) Outboard screw: 1.5 Nm [13 in·lbs]
3. Reinstall the end cover and torque set screws to 1.5 Nm [13 in·lbs].
4. If installing a journal, torque socket head cap screws to 20 Nm [177 in·lbs]. See page 5-4.

Wave springs

Position the two wave springs **(1)** on the aluminum strip **(2)** – one along each side – with the end of the spring pointing as shown below.





Do not reinstall broken wave springs. Call Maxcess Customer Service for replacement parts.

Air system

Replacing a valve

1. Stop the winding operation and deflate the shaft.
2. Using the recommended tool (see page 5-1), remove the valve.
3. If a patch-lock thread sealant is not already pre-applied, apply Loctite 545 to the valve threads and install; torque to 5 Nm [44 in·lbs].

Note: If you are reinstalling your existing valve, inspect the gasket for wear (cracks or delamination) and replace if damaged. See page 3-2, Item 2 note, for gasket part number. Ensure that there is a gasket in place on the valve when installing. New valves are supplied with a gasket.

O-rings

1. Stop the winding operation and deflate the shaft.
2. Remove the journal feature (see page 6-3).
3. Note the two o-rings in the shaft body. Inspect them for wear or damage and replace if necessary. Lubricate o-rings with Dow Corning Molykote® 55 o-ring lubricant.

Note: There are no o-rings used in the machine end of the cantilever shaft.

Reinstalling journals; page 5-4

Air System

Replacing the internal air hose

Cantilevered shafts with a rotary union valve deliver air to the expansion elements through an internal air hose.

Follow your company lockout/tagout procedure before removing shaft from machine.

Note: Use Loctite 222 on all threads during reassembly. Follow manufacturer's instructions for best results.

1. Deflate shaft and remove roll/core.
2. Remove shaft from the machine.
3. Remove both journals (page 5-2): detach the air hose during disassembly.
4. If you are using bulk air hose material, use the following formula to measure and cut to length for your shaft:

   air hose length = body length + 64 mm [2.5"]

5. Reconnect the air hose at each journal during reassembly.
6. Torque journal socket head cap screws to 20 Nm [177 in·lbs].
7. Torque nose cone (or body end cover) 1.5 Nm [13 in·lbs].

7-1 TROUBLESHOOTING

Problem	Possible Cause	Recommended Solution
Cores slipping	Low air pressure	Operate shaft at 5.5 bar [80 psi] minimum for optimal performance. Check for leaks. See "Shaft will not inflate or hold air" in the list below.
	Wrong core diameter	Shaft is designed to support core diameter of 76.2 ± .76 mm [3.00" ± .03"]
	External elements worn	Inspect elements for excessive wear or damage and replace as necessary. Call Maxcess Customer Service for parts.
	Web tension out of spec	Check your winding process.
Shaft will not inflate or hold air	Bladder leak	Listen for leaks or spray with soapy water to determine which element is leaking; replace the bladder. See page 5-7.
	Valve is leaking	Use soapy water to test the valve for leaks. Replace valve if necessary. See page 5-10.
	Bad o-rings in body end plug	Remove nose cone and body end plug to inspect o-rings for damage or wear. Replace o-rings. See page 5-10.
	Internal air hose is leaking or kinked	Disassemble shaft and check the air hose. Replace if necessary. See page 5-11.
Journals wear prematurely	High loads or speeds	Check PSDS specifications for your shaft application.
	Incorrect shaft mounting	Check shaft at installation mounting points.
Excessive shaft vibration	Shaft imbalance	Contact Maxcess Customer Service. 1.360.834.2345 1.800.426.1000

Specifications

WARNING – Do not use the devices outside of their rated specifications.

Refer to your Product Safety Data Sheet (PSDS) for your custom shaft specifications.

Operating air pressure	5.5–8.3 bar [80–120 psi]
Ambient operating temperature	38° C [100° F]
Core diameter	76.2 ± .76 mm [3.00" ± .03"]
Core types	Fiber or plastic

Service requests and replacement parts

To request service or to get replacement parts, contact Tidland or one of the locations listed on the back page of this publication.

Tidland
2305 SE 8th Avenue
Camas WA 98607
1.360.834.2345
1.800.426.1000

Please have your shaft serial number available when you call.

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